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# AMERICAN JOURNAL OF PHARMACY

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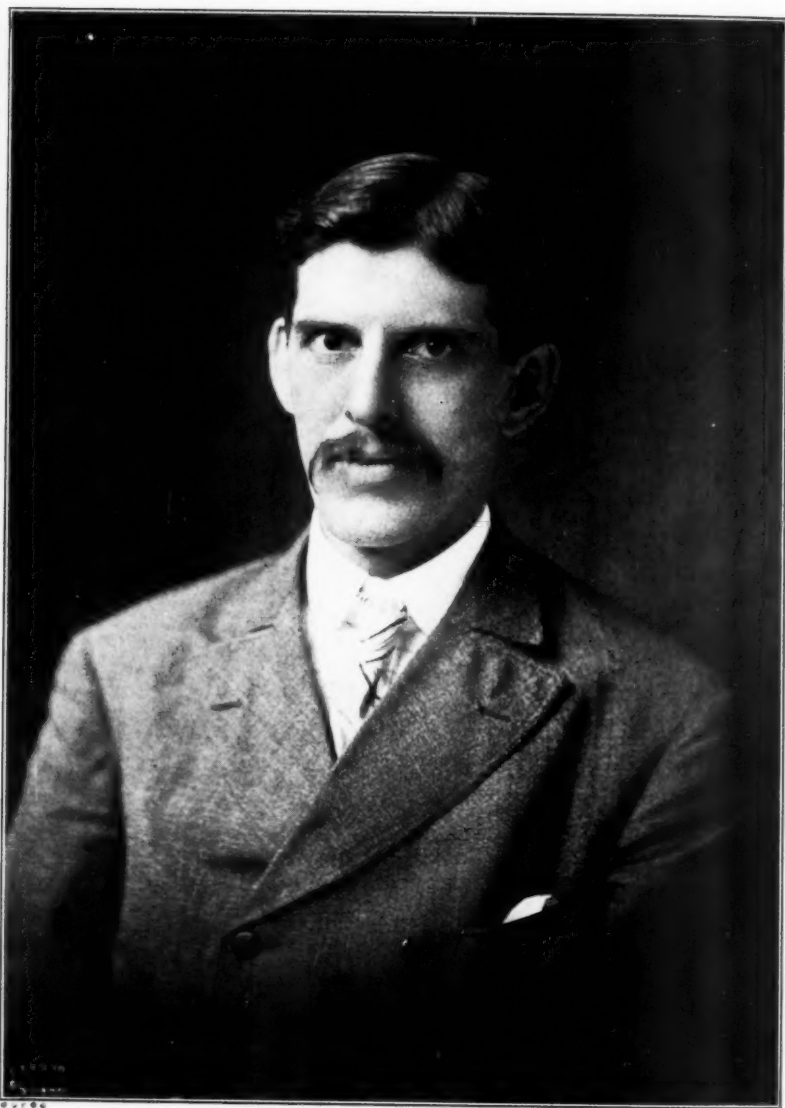
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MARTIN INVENTIUS WILBERT, 1865-1916.



# THE AMERICAN JOURNAL OF PHARMACY

*FEBRUARY, 1917*

MARTIN I. WILBERT, PH.M., PHAR.D.

BY JOHN K. THUM, PH.G.,

PHARMACIST AT THE GERMAN HOSPITAL, PHILADELPHIA, PA.

Martin Inventius Wilbert was born at West Leyden, Lewis County, N. Y., June the first, 1865. He was born of German parents, the second child in a large family. At the age of four years and two months his education was begun in a nearby country school. Subsequently he attended a private school in Utica, where he gave particular attention to the study of the language of his forbears, and later on attended Archambault's Academy in the city of Montreal.

His family on both the paternal and maternal side came to this country in 1852, his father having been born in Prussia and his mother in southern Germany. Their people were pioneers in what is now known as the Adirondack Preserve of New York State, clearing out their land and building homes of logs, which, as progress manifested itself, were followed by frame buildings.

Dr. Wilbert had the advantage of being brought up under an environment and home training whose influence manifestly shaped his whole career. His father had been educated in the German schools of north Germany, and as these schools are noted for their thoroughness and the strict discipline with which they are conducted, the studious habits and sense of discipline which he acquired naturally influenced and guided him in the training of his son. Those of us here in Philadelphia who were associated with Dr. Wilbert in his work, and in a position to observe his whole career, can readily testify to the thoroughness with which he did his work; no detail of it ever escaped his watchful eyes.

Of all the mental faculties that man can be blessed with, un-

doubtedly, that of a retentive memory, properly trained and cultivated, is of most use to him in the development of his intellect. Our friend had this in a most amazing degree, a memory that can only be described as tenacious, and this was supplemented with the gift or power of concentration. Some people say that the former is naturally the result of the latter, but a closer examination of this question will reveal that while concentration of the mind is conducive to the development of the memory cells, it does not altogether explain the wonderful examples we sometimes come in contact with, of retention by the mind of things seen or read, and which are always available for use by the fortunate owner at a second's notice. Both his father and mother are noted in the family for their remarkable memory power and their son inherited this faculty in generous proportions. And, as memory is the purveyor of reason, here we have the answer in this case as to why this man had such a particularly fine type of mind.

Besides being the possessor of this extraordinary memory he had remarkably keen power of observation. His mother has always been exceedingly fond of plants and nothing delighted her more than to have time for cultivating them and watching them grow, and her son Martin took after her very much in this respect. Plant life always had a strong fascination for him; nothing would please him more than an opportunity for a ramble in the fields and woods and the chance to study the plants in their natural environment. In this love of nature one unconsciously broadens in many directions, acquires a keenness of observation that becomes second nature, and develops the scientific mind. And Wilbert had this in a large measure.

After some time spent in the employ of a drug store in the city of Utica, he was impressed with the need for a broader field, more systematic training, and education along pharmaceutical lines, such as a recognized college of pharmacy could give. Accordingly, he came to Philadelphia and matriculated at the Philadelphia College of Pharmacy, from which he graduated with honor in 1890. He owned and conducted a retail store in Philadelphia for a very short time, and in 1891 he was appointed apothecary to the German Hospital, Philadelphia. At this splendid institution, built upon efficiency and devoted to service, he soon impressed the authorities with the fact that he was a man of ability and promise. In fact, he always impressed most people that he came in contact with as an unusual

man. I met him for the first time when I was about sixteen years of age and was quite impressed with the great fund of information that he possessed and the kindly manner in which he would place it at the disposal of whoever might be in need of some of it. Indeed, I have never met a man who was so willing to help others. And he possessed in a great degree the virtue of patience, almost unlimited patience!

Dr. Wilbert proved himself to be a most valuable addition to the hospital in many ways. He possessed the faculty of criticism in a large degree but, unlike most criticism, it was of a constructive nature; what he tore down he replaced with a better structure. He never seemed to be at a loss for ideas. In fact, he was that most useful of men, the man with ideas! There is always room in the world for such a type of man, and especially so in a modern hospital.

Just previous to his departure for Philadelphia to further his studies in pharmacy, amateur photography became very much the fashion and, with his usual avidity for knowledge, he provided himself with a camera and the necessary books on this absorbingly interesting subject. To one of his studious nature and research mind, the fundamental principles of this delightful science and art were soon mastered. Unlike many amateurs he performed every detail of the work necessary to obtaining the final picture. Every phase of the work was to him a great delight; from the ramble in the fields or woods in order to get some interesting bit of landscape or other view of glorious nature to the developing and printing of the exposures he made.

This proficiency in photography which he acquired stood him in good stead in after years at the hospital. He became one of the pioneers in the use of the X-ray in this country. It was very shortly after Roentgen had announced to the world his epoch-making discovery, that the German Hospital began giving its patients the benefit of this additional aid in diagnosis and treatment.

Dr. Wilbert himself made the first X-ray machine used in this institution and operated it himself with great success for some time. We still have it here, but only as an interesting relic. It would now be regarded as a very crude affair compared to the magnificent modern plant in use at the German Hospital at the present time.

Naturally, to a man of his exceptional ability and all-consuming acquisitiveness for knowledge, work of this kind was most congenial and interesting. In recognition of his work along this line, and

firmly convinced that this science would become a requisite for a modern hospital, the board of trustees of the German Hospital created a department of Roentgenology, and elected him the director thereof. He still, however, retained his position of chief apothecary. Besides being one of the pioneers in this work in this country he was also a frequent contributor to the literature that this wonderful science has evolved.

Strangely enough, while many of the pioneer workers were affected by constant exposure to this phenomenon of electricity, and some even lost their lives therefrom, Dr. Wilbert himself never seemed to have developed those insidious burns from which nearly all the early workers subsequently suffered. While some of these early workers scoffed at any possibility of danger, he was always careful to so conduct his work as to reduce personal exposure to a minimum. His common sense, which he had a good share of, is best illustrated by the reasons he gave for his carefulness in not permitting himself to be subjected to any unnecessary exposure. He said: "If this phenomenon of electricity is so very potent for good, it may in an equal measure be potent for extreme harm." Our present positive knowledge on this subject proves him to have been right.

It would be impossible within the brief scope of this memoir to go very deeply into his career as apothecary at the hospital. When the beautiful and imposing front had been added to the hospital in 1894, he was given permission to arrange and thoroughly equip a complete hospital pharmacy. To this day the German Hospital pharmacy is ample testimony to the capable and thorough manner in which he carried out this mission. From the day he came here, and, we are happy to say, to the present time, pharmacy has been practiced as the leaders with ideals in American pharmacy have always wished it to be practiced. Dr. Wilbert always held that the tendency of the average pharmacist to be satisfied to be a mere dispenser was a very regrettable one and if not checked would indefinitely postpone the day when pharmacy would be generally regarded as a profession.

He always held the opinion that the pharmacist was morally responsible for all medicines dispensed. He continued to hold to this to the end. It was a principle that he always fought valiantly for, and in return he was subjected to return fire from others who sometimes neglected to fight like gentlemen. However, those who

fight for a principle must be prepared for this, and, as Wilbert was a philosopher, he accepted the abuse and scurrility that was sometimes handed out to him with that spirit that only a great character always exhibits.

At the German Hospital pharmacy he adopted at once the policy of buying the crude drugs and chemicals from reliable sources and carefully testing them to see that they came up to official requirements. When they failed to meet the standards they were returned with a courteous note explaining the reasons therefor. He was a great believer in doing an unpleasant thing in a pleasant way. In other words he was always a gentleman. When the tested drugs and chemicals came up to the requirements, and not before, they were then manufactured into the various pharmaceutical preparations and dosage forms. This policy of manufacturing our own preparations was of inestimable benefit to both our patients and doctors, as the latter were always sure that medicines were true to label, and that their patients were getting just what they wanted them to get.

Everything in the pharmaceutical line was made, fluidextracts, effervescent salts, elixirs, emulsions, glycerites, infusions, liniments, collodion, ointments, suppositories, medicated waters, syrups, tinctures, troches, spirits, solutions, and mixtures of all kinds, hypodermatic tablets, and many thousands of compressed tablets in the course of a year. All this meant work and plenty of it, but it was pharmacy and was in the interests of economy. As the hospital, like all charitable institutions, has the privilege of tax-free alcohol, it was a distinct asset for it to have in its employ a man who was a real pharmacist and who was willing to work at it. And our dear friend was all of that; and not only that, but he had the happy faculty of inspiring his associates to the same desire for work and usefulness.

It was due to his initiative that the hospital has its own apparatus for making carbonated waters. Some years as many as over ten thousand bottles of these are filled. An automatic water still is also one of our useful possessions and the idea is one of the many good ones from his fertile brain.

Dr. Wilbert always had a horror for secrecy in the manufacture and sale of medicines, and while it may be admitted that many proprietaries do not come within this category, yet he could not altogether reconcile himself to even these, he contending that as the



patients generally paid many times what they would have to pay for a prescription of useful pharmacopœial drugs, it was not altogether honest. For a prescription to be presented to him calling for one or more proprietary medicines was like gall and wormwood to him. He felt so strongly and earnestly on this matter that the board of trustees, at his request, adopted the following resolution: "No prescription containing in all, or in part, a proprietary medicine shall be compounded or dispensed at the pharmacy of the hospital, unless the prescription shall be personally signed by a chief of the house, or a chief of the dispensary, or by the medical superintendent."

We doubt if there is another hospital in the country where the doctors confine themselves so closely to the prescribing of the really useful drugs known to science; where the administration of medicines is carried out in so rational and intelligent a manner. Our internes are cautioned against gullibility, and taught the advantages of exhibiting an intelligent and honest skepticism in regard to the newer remedies. We are fair to everybody when we assert that this policy was largely due to Dr. Wilbert's influence.

One of the most useful things that Dr. Wilbert did for pharmacy in this city was the initiative that he took in the organization of the Philadelphia Branch of the American Pharmaceutical Association. His activity in this matter was really the beginning of his development as the most marked power and personality in the profession of pharmacy to-day, and helped to develop him as *the* one who really and actually was the connecting link between the two professions of medicine and pharmacy. There was not a little diffidence among some of the leaders of pharmacy in this good old City of Brotherly Love at that time as to the advisability of starting, and the necessity for such, an organization. But behind our friend's genial disposition there was an indomitable will, and by the exercise of tact and diplomacy he aroused an enthusiasm that was almost equivalent to his own and the Branch was organized at once, with everybody wondering why, in the birthplace of pharmacy in this country, Philadelphians had not seen to it that the organization of the first branch should take effect in this typically American city, where nearly all the great movements in medicine and pharmacy had their inception.

The members of the newly-organized branch, in casting about for a secretary, for after all is said, the live wire in any organization is, or should be, the secretary, immediately recognized the fact that Dr. Wilbert was admirably fitted for this office and the



logical man for the position. He was repeatedly reëlected to this position and held it up to the time that he went to Washington.

Few could resist his infectious leadership and everyone of the membership put their shoulders to the wheel and strived to put pharmacy on a higher and better plane. I am sure that many of the thinking men in medicine and pharmacy in this city will agree with me when I say that his whole influence was directed to bringing about better relations between the physicians and pharmacists, not only in this City, but in the whole State, and he to a very large extent succeeded.

But Dr. Wilbert always held that such improved relationship could not be brought about and held, without a realization on the part of pharmacists of their shortcomings and an honest endeavor on their part to overcome them. He always freely acknowledged that there were many pharmacists who were of a high-water mark, but he always insisted, with fearless emphasis, that it was the duty of the more intelligent and better type of men in pharmacy, not to be merely content with the example they set to the rank and file of pharmacy, but to organize, point the way, and lead it to better things.

Bodies of men, if they would accomplish the fullest measure of their usefulness, must have, like individuals, an ideal and strive to attain it. There could be no civilization otherwise. In proportion as the nation has this spirit, just in such measure will it be able to render real service to itself and to the rest of mankind. Dr. Wilbert had ideals and I believe he came as near to living up to them as any man ever did. Moreover, he sincerely believed it was his bounden duty to make others see the light as he saw it.

Unlike many men with ideals he was of a most practical turn of mind. This was very forcibly impressed on many when he suggested, immediately after the Philadelphia Branch of the Pharmaceutical Association was organized, that a systematic attempt be made to bring before physicians the desirability of prescribing the really useful drugs and preparations of the United States Pharmacopœia and National Formulary in preference to the many undesirable proprietaries on the market. He advocated that the pharmacist equip himself in every way so that he could advise his medical clientele in an intelligent manner when he made his plea for their support; to fit himself so that his argument, that it was advantageous to both patient and physician, that the latter know something of drugs

and give a closer adherence to official drugs and preparations, would carry conviction.]

I believe it was in 1907 that the American Medical Association met in Atlantic City for the first time. [The Philadelphia Branch of the American Pharmaceutical Association was invited to give a scientific exhibition of pharmacy. Under Dr. Wilbert's inspiring enthusiasm an exhibition of the really useful preparations of the United States Pharmacopoeia and National Formulary was given that aroused the interest of physicians all over the country and caused considerable favorable comment in both branches of medicine.] The value of this idea was at once discerned by the other branches throughout the country and used to great effect in stimulating interest, or rather, renewed interest in official drugs and preparations.

But, as he pointed out, the Branch could not afford to stop at this point. It was but the beginning and must go on, if a proper harvest were to be realized. From that time on Dr. Wilbert worked unceasingly, sending the exhibition to the Philadelphia County Medical Society and its various branches, and lecturing earnestly for the cause of what was to the best interests of the pharmacist. The well-informed pharmacist can never forget his self-sacrificing interest in his behalf. He was quick to see that if this work was to be permanent and of lasting good the medical and pharmaceutical professions must work together and safeguard the interests of their patients.

This exhibition was afterward sent to various parts of the State of Pennsylvania and undoubtedly was of tremendous influence in developing the propaganda movement, not only in this state, but throughout the country.

At the meeting of the American Medical Association at Atlantic City, June, 1909, the Philadelphia Branch of the A. Ph. A., at Dr. Wilbert's suggestion, who was then located in Washington, gave another scientific exhibition of pharmacy and things related thereto. This exhibition was undertaken in a more elaborate manner and received support from members of the parent organization from Maryland, New Jersey, New York, Pennsylvania, and Washington, D. C. As the writer was a member of the committee who had the matter in charge, and its Secretary-Treasurer, he is in a position to speak of the valuable assistance he received from this valiant champion of a profession of pharmacy. [Nothing was ever too much for him. He was always helpful with advice, full of ideas and most un-

selfish in rendering practical assistance to carry them out. I will never forget how, on the pier at Atlantic City, when I found it impossible to get the services of a carpenter, Dr. Wilbert took off his coat and hat, collar and tie, and handling a saw and hammer like one born to it, erected the stand on which we arranged our exhibit. As we had been friends for twenty-six years and for a period of eleven years I had been his assistant at the German Hospital, I feel that I am in a position to say that it was typical of the man. He was essentially a worker and absolutely honest. There was nothing of the poser about him. And thanks to his whole-souled assistance and self-sacrifice, the American Medical Association conferred on the Philadelphia Branch of the American Pharmaceutical Association a certificate of honor for this splendid exhibition.

On October the first, 1908, Dr. Wilbert left the German Hospital, which, in a measure, was his home, to accept a position in the federal government, as assistant in the Division of Pharmacology of the Hygienic Laboratory, United States Public Health Service.

The severing of his relations with the "dear old German," as those who love the institution so fondly refer to it, was to him one of the saddest moments of his life. He had formed associations and friendships here which were very dear to a man of his largeness of heart, and we on our part must acknowledge that he had entered very deeply into our affections.

Dr. Wilbert was a well-read, many-sided man who took a deep interest in affairs and was particularly active in the advancement and betterment of his profession. He believed with his whole heart that man was put here by the Almighty to be of service to humanity, and to that end he gave himself gladly and unreservedly to many activities. Many of the members of the many scientific societies that he was a member of can testify to this! He was active in the affairs of the Franklin Institute, the American Pharmaceutical Association, the American Roentgen Ray Society, and the American Medical Association. He was a member of the Committee on Revision of the United States Pharmacopœia, the Committee on Revision of the National Formulary, the Committee on Recipe Book of the A. Ph. A., and a member of the Philadelphia College of Pharmacy. For many years he had been a member of the Publication Committee of the AMERICAN JOURNAL OF PHARMACY, published by the College. He contributed many articles to this journal, the oldest and best in this country. To attempt to enumerate and mention all

the articles appearing in this journal from his prolific pen would take much space. It will suffice to say that one can hardly pick up a number appearing in the last fifteen years without coming across a paper by him.

Martin I. Wilbert was regarded by all who knew him intimately as a particularly fine type of man. He never made any special effort to gain any one's good opinion or respect, he was just himself all the time. [His wide knowledge, kindliness, and good common sense, which was recognized by everybody here, and which he had in large measure, commanded respect and admiration from all who came in contact with him, either in a business or social manner. He was never ostentatious in any of his actions or words. He was tolerant, modest, and unassuming and always charitable in his judgments of others.] Can any one have any finer characteristics than these? His many friends and associates at the German Hospital felt his departure keenly and to the day of his death took a keen interest in all he did in his new sphere of activity. And of the hospital, he always spoke of it as "home." And in the home that he loved so well and among friends of many years, it was vouchsafed him to pass into the great beyond.

As the *Journal of the American Medical Association* rightly says, "the full measure of his influence at Washington in behalf of the public health will never be fully known." [He was most active in helping along the passage of the Harrison Narcotic Law, and a valuable counselor to the National Drug Trade Conference, the representative body whose efforts resulted in the law as it now stands.

By his work in connection with the Digest of Comments on the United States Pharmacopœia and the National Formulary he has built a monument that will endure for a long time. [This really very necessary adjunct to the revision of a pharmacopœia was inaugurated by Dr. Charles Rice, who was one of the first to point out the real necessity of a compilation of the criticisms on the pharmacopœia and the substances that enter into it.] Only by some such method would it be possible to publish a book that would be representative of the time. The request of the board of trustees of the United States Pharmacopœial Convention to the surgeon-general of the U. S. Public Health Service, for assistance and coöperation in the compilation and publication of a "Digest of Comments" not only gave to this work the backing and resources of the federal government, but likewise brought to the task the assistance of the one man in this



country best qualified to do it from every standpoint, that portion of this monumental work referring to foreign pharmacopœias being particularly well done. Indeed, [Dr. Wilbert's knowledge of foreign pharmacopœias was very comprehensive. It is doubtful if there is another man in this country who possessed such a wide and varied knowledge on this subject as he did.]

He was always willing and ready to start something that might be for the general good and make for progress. He had hardly become settled in Washington before he saw the need for the organization of a local branch of the American Pharmaceutical Association in that city. To see the need was for him to act. He possessed more initiative than a dozen ordinary men despite the fact that his health was never very robust. From childhood his health had never been rugged. Yet in spite of this handicap he was always undaunted; no amount of work ever fazed him. He was a most tremendous worker. If, as Carlyle says, "genius is a capacity for hard work," then Dr. Wilbert was most certainly a genius. He was never idle for a moment. [The Branch in Washington was promptly gotten under way and he was made secretary.] Under the stimulus of his remarkable energy this branch has done work that the parent organization need never be ashamed of.

[I believe it was in 1902 that he became a member of the American Pharmaceutical Association.] From the very beginning of his membership he became very active. He was full of enthusiasm over this new outlet for his energy and activity. [He never attended a meeting without having one or more papers to read. A perusal of past proceedings shows that in debate and discussion he made himself a power to be reckoned with.] His wide range of information and the thoroughness with which he accomplished every task that was set before him was appreciated by all. In committee work he was an exceedingly able worker and counselor. [When the Commission on Proprietary Medicines was formed it was immediately appreciated when Dr. Wilbert's name appeared among those appointed, that the most logical choice had been made. His unquestioned fitness for this work was undoubtedly of transcendent value to the A. Ph. A. because of the rich experience he obtained as a member of the Council on Pharmacy and Chemistry of the American Medical Association. As an instance of how one opportunity leads to another, I may say that when the sentiment of the Association for some method of formulating Standards of Unofficial Drugs had crys-

tallized itself into the formation of a Committee of Unofficial Standards for this specific purpose, Dr. Wilbert's qualifications and special fitness for a place on this important committee were not overlooked. Whenever and wherever there was work to be done, there you found Dr. Wilbert. Always in the forefront, ready and willing for service.

The constructive work that he has done as a member of the American Pharmaceutical Association will perhaps never be surpassed. He was an original thinker, and, as previously mentioned, brimful of ideas! And his ideas, combined with the suggestions of others and the willing coöperation on his part with others to carry them out for the general good, were ever at the service of this association, whose history is the history of American pharmacy.

[ Dr. Wilbert was a voluminous writer on pharmaceutical and pharmacological subjects. His literary output was notable not only for its quantity and clearness of style, but likewise for its originality and high order of thought. The great diversity of thought and topics touched upon by him clearly reveal his wonderful versatility. He touched upon many subjects connected and allied with pharmacy and handled them all with that thoroughness and attention to detail that he was noted for.] The efforts of the early leaders to develop pharmacy, and place it on the same plane with the other learned professions, were ever in his thoughts, and he endeavored always, with voice and with pen, to carry forward the work to the end for which they had so earnestly labored in the past. He was a most earnest worker in the cause for better and brighter things in pharmacy, and I am sure that I voice the thoughts of many when I say that he has left an impression not only on pharmacy, but likewise on certain medical interests, that will endure for a long time. To the younger men in pharmacy his name will ever be an inspiration and his life an illustration as to what industry and perseverance can lead to.

[In the field of medicine his name shines most brightly as one of the ablest workers on the Council on Pharmacy and Chemistry of the American Medical Association. He was one of the organizers of this Council whose aims are the development of a more rational therapeutics; to offer some measure of protection to the medical profession and the public against the fraudulent advertising of proprietary medicinal articles; and to develop a propaganda against the spread of quackery and harmful self-medication and indulgence by the laity in nostrums.] To this end he performed a tremendous



amount of labor. The well-informed can never forget his work in this connection. [With Dr. R. A. Hatcher, he was a collaborator in the writing of a most useful volume called "The Pharmacopœia and The Physician."] The fact that this volume is now in the third edition is sufficient affirmation of its usefulness to the medical profession. And [in the pages of the *Journal of the American Medical Association* he frequently gave expression to thoughts of paramount interest to physicians.] It is no exaggeration to say that the medical profession owes much to him and his unselfish efforts.

[He graduated with honor from the Philadelphia College of Pharmacy in 1890 and in 1903 he received from his alma mater the degree of *Master of Pharmacy in Course*. From the Medico-Chirurgical College of Pharmacy and from the Georgetown University he received the degree of *Doctor of Pharmacy*, in recognition of his able work in behalf of his chosen profession.

He is survived by his wife, father and mother, and five sisters. Requiescat in pace.]

## BIOLOGICAL STANDARDIZATION.

BY HERBERT C. HAMILTON.

Under this heading Rusby (1) reviews the U. S. P. methods for standardizing the drug and glandular extracts which admit of no exact chemical assay. He asserts that from the viewpoint of the medical profession any favorable opinion regarding these methods was almost entirely because of "confidence in those who recommended them." But that even "this confidence was considerably weakened because of radical differences which existed among those authorities." The parallelism between therapeutic value and the measured physiological effect was also questioned. "On the other hand the convention had the greatest confidence in the specialists who were in charge of these investigations."

The review while entirely impartial is lacking in one important feature, it fails to give the viewpoint of the manufacturer just as the revision committee failed to give it due consideration. The importance of this feature is in the fact that the manufacturers were in many instances the originators of the tests in use, and had of necessity developed them from scientifically interesting facts to

a practical working basis. These manufacturers through years of experience were in a position to eliminate the nonessentials and to arrive at some common ground by compromise. A method which under certain conditions can be made fairly satisfactory may fail entirely when attempts are made to apply it under practical working conditions.

As may be inferred from the foregoing introduction it is the purpose of the writer to point out certain objectionable features in the biological assays which are either suggested or required in the 9th Revision of the U. S. Pharmacopœia (2).

We will assume, as the Revision Committee evidently did, that a biological method can be found which is a measure of therapeutic value.

It is very natural that opinions should differ among pharmacologists as to which reaction more nearly represents the activity of a drug, when the drug has a number of apparently different therapeutic uses.

It is no more remarkable that differences of opinion exist as to which is more accurate, if several assay methods are available. One can expect therefore that the methods adopted would be subjected to criticism, for in this way only can errors be eliminated.

#### THE DIGITALIS SERIES OF HEART TONICS.

The method adopted for the assay of the digitalis series of heart tonics is that known as the one-hour frog heart or the minimum systolic dose (M. S. D.) method.

In a review of the various methods in use Edmunds and Hale (3) eliminated most of them as illogical or inaccurate. These authors found little reason for choice between the one mentioned above and another known as the minimum lethal dose (M. L. D.) method.<sup>1</sup> Their preference inclined toward the former on the basis of cost and time.

This method leaves much to be desired in regard to accuracy and dependability, since if one economizes either in time or in material it is usually at the expense of accuracy.

<sup>1</sup> The M. L. D. or minimum lethal dose method is described in detail by Houghton and Hamilton (4). The M. L. D. is the smallest dose per gram weight of frog which kills a majority of the test animals, the correctness of the end point being verified by observation of the laid-bare heart, which is in systole, if death is due to the uncomplicated action of one of the digitalis series.

This method is subject to the same variable factors as the M. L. D. method, namely, temperature, season, different species of frogs and their individual susceptibility with the additional disadvantage that absorption becomes a more serious factor on account of the shorter time of action. The apparent advantages—fewer frogs and shorter time—are under some conditions real disadvantages because in case of delayed absorption a frog's heart will be found beating in 1 hour, even when dosed with the M. S. D. while the M. L. D. would not be appreciably affected. Another important point in connection with the end point in the M. S. D. method is the effect of pithing the frog and laying bare its heart. Is it reasonable to suppose that this has no influence on the condition of the heart? Whatever this influence is it can scarcely be inferred that this is an invariable and uniform effect. The method therefore introduces one more factor, the effect of which tends towards variability rather than in the direction of increasing accuracy.

After an extended series of tests Hamilton & Rowe (5) found that the M. S. D. of digitalis is less than the M. L. D., showing that an early paralysis of the heart occurs which may be the cause of the observed indefinite end point. This paralysis seems to have no uniform relationship to the M. L. D. since in some cases the M. L. D. and M. S. D. were identical, while an average of 14 experiments showed the latter to exceed the former by 22 per cent. in the case of fluid extracts, and 36 per cent. in the case of tinctures, the latter being an average of 12 tests. In one assay of a tincture by both methods the M. L. D. exceeded the M. S. D. by 60 per cent.

The conclusion of Edmunds and Hale that choice between the two methods is largely one of convenience seems unwarranted. The most uniform end point, and the most logical, is that where the sample of a digitalis preparation has an opportunity to complete its cycle of effects and to be measured by the size of the minimum dose which causes death of the frog with heart in systole. Any other stage in this cycle is more variable and therefore less accurate as an end point for the reaction.

The standard, ouabain, adopted by the committee for comparison in measuring the activity of the digitalis series of heart tonics is also open to criticism because it is obtained from a non-official strophanthus seed and because different lots are not uniform in composition.

While it is true that the standard, in physiological assaying, is merely to measure the resistance of the frogs, this resistance is of

such a complex character that it should be measured by a standard, not in any respect open to criticism. The standard, if not identical with the sample, should be one whose composition and identity has been established.

The description of ouabain indicates that it is derived from a non-official strophanthus seed, that its composition is indefinite in that it crystallizes with varying quantities of water and that it does not yield a crystalline strophanthidin and cannot therefore be assayed chemically to establish uniformity. That it is not uniform is shown by Rowe (6), a conclusion which may be deduced from the fact that the M. S. D. of ouabain accepted by the U. S. P. Committee is .0000005, while the average of the three samples tested by Rowe is .00000086 or 76 per cent. more—a difference not due to temperature, because in all cases the tests were carried out at 20° C. Further it is an expensive substance and obtainable only by importation. These and perhaps other objections would certainly have been brought out by the ones who must use the test if such an opportunity had been granted.

Strophanthin from Kombe seed can be made of uniform composition and activity according to Brauns and Closson (7) and is therefore preferable to ouabain for every reason, but its use seems especially logical because of being derived from the official strophanthus seed.

#### *Cannabis.*

The biologic assay of cannabis indica is another that is open to criticism, not only in the wording of the text, but in the size of the test dose and in certain of its details.

As to the words used, the statement is made that cannabis "produces incoördination when administered to dogs in a dose of not more than 0.03 mil of fluid extract, . . . ." How much smaller dose will show a similar, but less marked effect? What is the effect of a larger dose? A logical wording would be that Standard F. E. Cannabis produces incoördination in a dose not less than, etc.

The dose chosen is too small for a satisfactory test. The average dog will scarcely react to a dose of this size and if the drug is somewhat less active than standard, the animal will not react visibly. Under the rather drastic conditions imposed, some dogs will show the effect of cannabis to a fairly satisfactory degree, but a large majority will show the effect very slightly if at all—a statement corroborated by Pearson (8).

A much more satisfactory test dose of a standard cannabis preparation is one which when administered under proper conditions will show a well-marked action. Then if the preparation being tested is somewhat less active than standard or the dog slightly less susceptible than normal, an evident although less marked effect is produced. In this way a measurable difference can often be established, a difference which can be verified by a second test. A dose of 0.1 mil of the standard fluid extract does not produce an effect too great to obscure the reaction of a sample, slightly more or less active than standard. This dose is therefore recommended as the standard test dose. In a former communication the author (9) suggested 0.01 Gm. as the dose for the extract and a minimum dose of 0.09 mil (Cc.) of the fluid extract.

Testing the standard on each occasion is an unnecessary and expensive procedure, since a dog proved to be susceptible to the standard to the proper degree remains fairly constant for a long period, if in good physical condition. This is admitted in the official description of the test animals (2).

Testing a sample on two dogs which have been chosen because of being susceptible to the standard test dose of cannabis is sufficient unless one or both exhibit a reaction very different from that to be expected. In such a case the susceptibility of the dogs should be reestablished.

Starving a dog for twenty-four hours is a longer period than necessary. Twelve hours is generally sufficient to empty the stomach, and is less trying on the test animals.

Regarding the standard, some more exact method should be devised for obtaining uniformity among manufacturers. As prescribed by the U. S. P. the activity of a sample depends on the susceptibility of the dog, and it may be any kind of a dog.

If a test is attempted for the first time and no reaction follows, how can it be determined whether the sample or the animal is at fault?

Since the test is compulsory it should be the duty of some central authority to supply a sample which meets requirement to every manufacturer of cannabis products, and so insure the uniformity which is planned to attain.

It is an unnecessary requirement to compare each cannabis preparation with the standard in the same form. If the standard is in a stable form it can be considered equally active if .004 Gm. is in ex-



tract, fluid extract or tincture form, while in fact the statement "A standard fluid extract will produce incoördination when administered to dogs in the dose of 0.03 mil, the extract in the dose of 0.004 Gm., the tincture in the dose of 0.3 mil for each kilogram of body weight of dogs," gives one no option in dosing, and practically makes a test of the standard unnecessary. The effective dose of each is prescribed without any opportunity of varying it to adjust for a lower susceptibility of the test animal. If the method provided for this contingency, it would be logical to compare sample with standard in every case and to eliminate every possible cause for unequal effects.

Further criticisms of this test of cannabis preparations are that the drug, while intoxicating in a sense is not known to be fatal in a relatively immense dose and consequently is not a dangerous drug; and that it has no very extended application in human therapy. It therefore scarcely deserves so much attention especially when the extra refinements of testing suggested add so little to uniformity in the activity of its extracts and so much to the cost of standardizing.

#### *Suprarenal Gland.*

The biologic assay of products of the suprarenal gland is open to criticism in only two particulars, namely, in the method of measuring and administering the doses and in attempting to check the results as described.

Using both femoral veins for injecting sample and standard alternately is probably intended to obviate the possible mixing of the two solutions if both are injected into the same vein. But it introduces a very much greater source of error. The amount injected can much more easily be measured by use of a pipette than in a syringe, and the dose after being injected can be easily and completely washed into the blood stream by a follow-up injection of 2 mil (Cc.) physiological salt solution. When this procedure is followed, no mixing of two injections is possible.

By the U. S. P. method it is difficult to measure accurately small differences in the dose, and impossible to insure that the entire dose enters the blood stream. The small part remaining in the dead space of the vein seems to be destroyed, because doses administered by the U. S. P. procedure are invariably less effective than when immediately and completely carried into the blood stream by the method suggested above.



The requirement of checking an assay by making the injections of sample and of standard into the opposite sides from those first used is no check except in so far as it checks conditions on the two sides of the dog. This feature can better be eliminated by using only one side. Further, by the official method, if it is impossible to complete the test and the check on a dog, no option is left, but to repeat both test and check on another dog. It is occasionally necessary to check an assay on a second dog when conditions during the first test were unfavorable for accuracy, but no advantage results from a retest on the same dog.

#### *Pituitary Gland.*

The assay of liquor hypophysis, while not included in the biological assays on page 604 *et seq.* is none the less biologic. It is also compulsory for a U. S. P. product. It is open to criticism because of the nature and dose of the standard and because of the unsatisfactory character of the test reaction chosen.

First as to the standard, it seems unwise as well as unnecessary to choose as the standard a substance which has only one of the typical physiological effects of hypophysis, and which alone has no therapeutic application equivalent to that of extracts of the pituitary gland.

In a previous communication (10) the author described the means of obtaining a satisfactory standard test solution, this being a fresh solution of the water-soluble part of the dried, defatted, powdered infundibulum.

Because of the possible variation in the content of active agent in different lots of glands, a stable, highly active, water-soluble powder prepared by Aldrich (11) has been largely substituted in the commercial standardization of pituitrin. The dried glandular substance first mentioned, however, can be easily prepared and is well adapted to the purpose of making the standard test solution.

This has the distinct advantage over histamine of being identical in action with extracts of the glands both on the isolated uterus and on other unstriated muscles, especially those controlling blood pressure.

Active extracts of the pituitary gland are remarkable for their action on smooth muscular tissues, contracting the uterus and intestinal muscles and the walls of the veins and arterioles. As results

of this action, the blood pressure is raised, peristalsis is increased and the tone of an inert uterus is aroused.

It is logical to assume that all the effects are due to a constituent which acts on unstriated muscle and to choose one of these as a test reaction—one which is accurate and measurable. If, however, the action on the pregnant uterus is due to a constituent other than that which affects the blood pressure, then it is essential that the oxytotic test be applied to those preparations intended for obstetrical work. But for the assay of such as are used to control the blood pressure in cases of shock it would be necessary to apply the blood pressure test.

While some investigators, notably Fühner (12), claimed to have produced evidence that two or more constituents are present in an active extract, others have found the two principal effects to go hand in hand, pointing either to the presence of only one active constituent or to a constant ratio in the content of the two constituents. Roth (13) whose work was probably the basis for the choice both of the method and the standard test dose, submitted little conclusive evidence for his choice of the oxytotic method. He made his selection because "the simplicity of the isolated uterus method, together with the fact that the uterus of the virgin guinea pig shows little variation in its reaction to pituitary extracts even after hours, places it above other methods in point of desirability as a method." His objection to the blood pressure method is "that one encounters a degree of tolerance when a second or succeeding dose is given."

On the latter point he submits as evidence of toleration a series of 14 consecutive injections of pituitrin, only 9 of which, however, illustrate his point. Each of the first five were followed by an almost identical rise in pressure, while the others were made in a manner contrary to his own suggestion, namely, "the period between injections to be at least 30 minutes long." The nine injections were made with an average interval of 5 minutes and into a dog which was apparently incompletely anesthetized. He submits no evidence whatever on the point that "little variation is shown in the reaction of the isolated uterus to pituitary extracts even after hours."

While the method is apparently simple the test strips of uterus muscle which will respond differently to different sized doses with any degree of accuracy are so few that a dependable test can rarely be made. On the other hand a blood-pressure test can be made on dogs with few exceptions and the "tolerance" referred to is scarcely

to be observed when testing a good carefully prepared extract. It can be eliminated entirely as a factor by the alternate injection of sample and standard. These facts are brought out and illustrated by Hamilton & Rowe (14), who suggest that clinicians working in conjunction with pharmacologists aid in determining which reaction more nearly coincides with therapeutic value. No positive evidence has yet been brought forward to prove that the blood pressure test carefully carried out is not a direct measure not only of pressor, but also of oxytocic activity together with its action on the kidneys, intestines and the mammary glands.

When a therapeutic agent such as the extract of the pituitary gland has been in practical use for nearly ten years and through clinical as well as laboratory experiments has been standardized to a certain degree of activity—a strength demanded by obstetricians and surgeons as essential for obtaining the desired results—any readjustment of activity should be made with extreme caution.

The revision committee, however, ignored this phase of the question and have adopted a standard activity for Liquor Hypophysis U. S. P. 9th, considerably below that of the standard preparations on the market.

To make an official extract from this gland material conforming in every respect to U. S. P. requirements lowers the standard from that at present generally used by the medical profession to one only 40 per cent. as high activity. Is there not reason enough for Dr. Rusby's statement that "it may safely be said that its (biological standardization) efficiency and authority were seriously doubted by a large majority of the medical profession"?

It is in many cases difficult enough to answer the question "Is the sample of drug that has been found to possess the greatest power to kill a cat the one that will prove most efficient in curing a man?" The advocates of biological standardization are now in the position where they must either ignore the official "biological assays" or be forced to justify methods which are in part at least illogical and inaccurate and standards which are not in line with medical requirements.

Considering the present status of biological standardization this is an unfortunate situation.

## SUMMARY OF OBJECTIONS TO THE OFFICIAL BIOLOGICAL ASSAY METHODS.

## THE HEART TONICS.

- 1st. The inaccurate method because the end point is obscured by (a) variable rate of absorption, (b) shock in exposing the heart.
- 2d. The standard, because it is not from the official drug and is not uniform in composition or activity.

## CANNABIS SATIVA.

- 1st. The inaccurate wording in the text.
- 2d. The smallness of the test dose.
- 3d. The absence of a uniform standard.
- 4th. The non-essential features which add to the complications of the method with no commensurate gain in the activity or uniformity of the product.

## SUPRARENAL GLAND.

The complications introduced into the test:

- (a) The inaccurate manner of measuring the test dose.
- (b) The incomplete administration of the test dose.
- (c) The method of making a check assay.

## PITUITARY GLAND.

- 1st. The inaccurate and unsatisfactory character of the method
- 2d. The standard, which is not adapted to measuring blood pressure activity, is not a practicable oxytocic agent in therapeutics and is not derived from the pituitary gland.
- 3d. The activity of the standard product.

From the Research Laboratory of Parke Davis & Co.

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## THE PHARMACEUTICAL USE OF THE FILTER PRESS.

BY JAMES F. COUCH AND JAMES E. KERSEY.

Filtration may be defined as the resolution of a disperse system into liquid and solid phases by means of a diaphragm permeable by the liquid only. In practise such a perfect separation of the system is seldom, probably never, realized. We submit mixtures to a process of straining whereby all particles which are larger than a certain minimum size are retained by the strainer and all others pass through into the filtrate. The filtered liquid may at first appear crystalline, yet after months of undisturbed standing on a shelf a slight, fine precipitate will be found in the bottom of the container caused by the agglomeration and deposition of the invisible particles which the strainer did not retain.

Accomplishment of the most complete separation of the phases in a minimum of time constitutes the problem of filtration. Let us consider the various means employed for its solution.

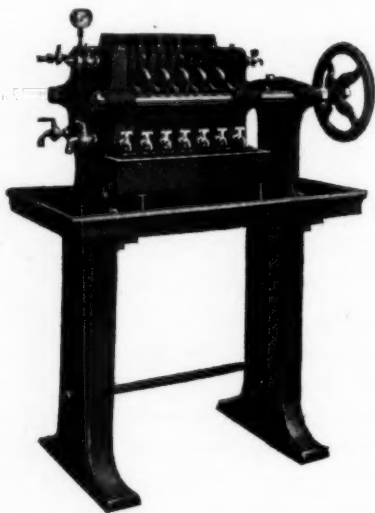
In general, filtration processes may be divided into two classes: first, those which depend upon gravity, and second, those in which extra pressure is employed. Of the first class the most commonly used is the funnel and filter paper method. This is adapted to all sorts of variations and is quite satisfactory for small volumes of liquids. Its great disadvantages consist in the continual diminution in the rate of filtration and the evaporation of solvent from the surface of the mixture which causes a change in the menstruum, a rearrangement of the solution, and, possibly, precipitation with the first portions of filtrate. If a filtering agent is used with the paper the rate of filtration is retarded still more and may be entirely stopped while the volume of liquid absorbed, and consequently lost, is very much increased.

Filter bags of felt are occasionally employed. They are useful for hot filtration or for syrups but are slow and permit visible particles, notably starch, to pass through, so that filtrates from them are frequently cloudy. Straining through cotton or woollen cloths is resorted to when coarse precipitates are to be separated but this method has only a limited application in pharmacy.

There are in use devices for securing added pressure in filtration by contriving a column of liquid several feet in height in such a way



that it may exert force upon the liquid which is filtering. Such arrangements are intricate, involve an undue amount of room, and may present difficulties in cleansing.



The Sperry laboratory or 10" filter press equipped with plates and frames which are convertible into the various arrangements used in commercial apparatus. It can be used as a press equipped for "Thorough Washing" or "Simple Washing." Arrangements are provided so that either of the above two arrangements can be used with separate discharge for washing or not, as desired. Filtrate can be made to discharge from separate cocks, from each plate or from one large cock at the head of the press. In practice the former arrangement is called "Open Discharge," while the latter is known as "Closed Discharge." It is a commercial machine in every respect. Other sizes are 18", 24", 30", 36", and 42". Plates and frames can be made of iron, as shown in the cut, or of lead or wood.

Added pressure secured by means of the suction pump or aspirator is very infrequently of use in pharmacy. The most serious objection to this method arises from the fact that the filtrate is necessarily exposed to low atmospheric pressure and under such conditions the volatilization of alcoholic menstrua is so rapid that it condemns the process.

Centrifugal filters are rapid and efficient. They are, however, better adapted to cases where the solid matter is the desired product, as in the separation of mother liquor from crystals, than for strictly pharmaceutical purposes where the insoluble substances are com-



monly worthless. The centrifuge is wasteful ; it splashes the filtrate about the outer jacket and, unless the center of gravity is carefully maintained in the shaft, will vibrate, shifting the "cake" and upsetting the filtration.

In the filter press process the liquid to be filtered is pumped through the filtering medium. The rate of flow can be easily controlled and the amount of pressure exerted adjusted to the particular conditions. Loss of material due to slopping or evaporation may be reduced to a minimum and, once started, the press may usually be left to itself to complete the operation. The method has the disadvantages of requiring expert handling, the absorbed liquid is likely to be large, small quantities cannot economically be filtered through the press, and the cleaning of the apparatus is a matter of some labor.

The press used in the laboratory of the Standard Chemical Company is a small Sperry machine of six chambers. The liquid is fed into the press by a single-plunger, belt driven pump equipped with an air chamber and safety tube. The *modus operandi* is as follows :

The liquid to be filtered is prepared by proper aging, with or without the addition of filtering agent according to conditions, and is then filled into barrels which are connected with the pump. A quantity of a filtering agent is now put into the liquid and thoroughly stirred in so that it may enter the press gradually with the liquid. This is an important detail and, if not observed, the press will clog when resinous or mucilaginous precipitates are present.

The liquid is sucked into the pump through an iron pipe connected with a rubber tube of convenient size which is lowered into the barrel. The open end of this tube should be protected by a piece of sieve rolled into a cylinder and fitted so as to form a prolongation of the tube. This precaution prevents the entrance of coarse particles which might lodge in the pump valves and interfere with their proper action.

The pump should be selected with care. We consider a motor-driven pump preferable to a steam-driven pump for general pharmaceutical use for the reason that the steam power available in the average pharmaceutical house will not be adequate to overcome a back pressure of one hundred twenty pounds in the press, a pressure often encountered. The number of cylinders desirable increases with the size of the press and the filtering surface to be fed. A three-cylinder pump will deliver a steady stream of liquid prac-

tically free from pulsations but, if an air chamber is attached, a single plunger will answer pharmaceutical requirements.

The plunger should admit of adjustment so that the volume of liquid delivered at each stroke may be varied to compensate the viscosity of the mixture being filtered. True, this might be controlled by varying the speed at which the pump is driven or by proper regulation of the safety tube but either of these methods involves other difficulties which make it more practicable to adjust the plunger. Our plunger is  $2\frac{3}{4}$  in. in diameter with a full stroke of  $1\frac{1}{2}$  in., so that the total volume which may be delivered at each stroke is about 5 (4.935) fluidounces. It may be adjusted to any lower volume and, for filtering light liquids, we regulate it to three fluidounces per stroke.

The speed at which the pump should be run is determined by the filtering area of the press and the volume of liquid delivered by each stroke of the pump. This must be determined by direct experiment. The ideal condition is the one where the volume of liquid forced into the press by the pump is just enough to fill the chambers and keep up a steady flow of filtrate without causing an undue increase in pressure. We operate our pump at a rate of sixty strokes per minute, which gives us a possible capacity of 140 gallons per hour. This is never attained in practise; with most fluid mixtures we operate at a rate of from seventy to ninety-five gallons per hour.

The valves of the pump should be easily accessible so that they may be readily cleaned during and after the filtration. Small particles of solid matter derived from sugar or chemicals frequently lodge in the valves, interfering with their proper closing and so causing leakage. This decreases the efficiency of the pump and may become serious enough to stop the filtration. A little practise will enable the operator to determine which valve is affected.

The packing around the plunger should be of the cold-water type firmly embedded in place. Yet, with the utmost precautions, there will be a small amount of leakage through it whenever the pressure rises above one hundred pounds per square inch. Below this point leakage may be prevented.

The pump is connected with the press by an iron pipe of suitable size ( $\frac{3}{4}$  in. is convenient), so arranged that it may be taken apart and cleaned. A safety tube, closed by a gate valve, is fitted into this by a T. The function of the safety tube is to return to the barrel any excess liquid which the pump is delivering to the press

above the amount which the press is filtering. This affords a second means of controlling the pressure and is of service in those cases where the pressure gradually rises during the filtration as the cake of precipitate thickens in the chambers. With easily filtered liquids the safety tube may be kept closed and it should never be opened until rising pressure, indicated on the gauge, demands some release.

The air chamber may be placed anywhere between the pump and first chamber of the press on the connecting pipe. If a single-plunger type of pump is employed the air chamber becomes a necessity to equalize the pressure. Without it, the pressure will vary during each stroke of the plunger, sometimes as much as eighty pounds, rising and falling in pulsations. The effect of such a continual pounding is to pack the cake firmly in the chambers and eventually this concreted wall becomes impenetrable and filtration ceases. The air chamber takes up the excess pressure and, even with the most refractory liquids, diminishes the variation in pressure to, at most, twenty pounds. A pet cock should be fitted to the lower extremity of the air chamber to allow it to be drained and cleaned.

The pressure gauge is usually placed just before the first chamber of the press. Its functions are too obvious to require comment here.

After leaving the pump the liquid enters the press, is conducted by a channel into the several chambers, passes through the filter-paper walls, and drains out at the bottom into a trough which leads it into a covered receptacle.

The press consists of a number of solid plates of iron separated by hollow "distance" frames so arranged that the whole may be securely clamped together, forming a series of chambers or cells. Lateral openings connect them with the channel, through which the mixture enters, bored throughout the length of the press and terminating in a pet cock which is used to permit the escape of air when the press is started. The vertical walls of the chambers are formed by the solid plates which are corrugated in such a way as to lead the filtered liquid to an outlet in one of the lower corners through which the filtrate is discharged.

The actual filtration is accomplished in these chambers. Heavy sheets of canvas are suspended over the faces of the solid plates and, for technical use, these serve sufficiently well; for pharmaceutical purposes, however, better filtration is demanded and the cloth is, therefore, covered with one or more sheets of filter paper. The

paper used should be of good quality and fine weave. Fine gray filter paper answers well. It is of the highest importance that cloth and paper fit well and lie smoothly on the plates; wrinkles and up-turned corners prevent the proper closing of the press and furnish channels for the escape of liquid. It is also important that the press be closed as tightly as possible to prevent spurting from the chambers.

During the filtration the chambers become filled with a mixture of filtering agent and precipitate: in most cases it is possible to add just sufficient talc or kieselguhr to the liquids to fill the chambers as the last of the liquid enters and this can be determined by experiment; however, should the chambers fill before the liquid is all through, the press should be drained by pumping air into it and then should be cleaned and readjusted.

The amount of material left in the chamber after filtration depends largely upon the nature of the filtering agent used. We employ kieselguhr almost exclusively, for reasons given below, and find that each chamber when filled under pressure will hold 18 ounces (av.) of dry kieselguhr which will absorb and hold 28 ounces (av.) of liquid. We have no figures for other agents.

The absorption of liquid, as we stated above, constitutes one of the disadvantages of the filter press and yet it is no larger, for a given volume of liquid, than the absorption in ordinary gravity filtration. The absorbed liquid may be recovered by pumping a small quantity of water through the press, but that method involves pharmaceutical difficulties. We drain the press by pumping air into it, thereby forcing a large quantity of the absorbed material out; that which remains behind is lost.

It may be said that every liquid to be filtered presents a new problem and requires individual treatment but, for practical purposes, we can divide preparations into four classes, three of which depend upon the viscosity of the liquid which, in turn, depends upon the nature of the ingredients present and the character and amount of precipitation.

The least troublesome class of liquids comprises the very fluid elixirs and solutions, such as simple elixir, essence of pepsin, elixir of iron, quinine, and strychnine phosphates, and the various elixirs of "lactated" pepsin. These preparations commonly filter rapidly without elevation of pressure and with little decrease in the rate of filtration.

More viscous liquids, such as heavy elixirs, light syrups, solutions of resinous drugs, or preparations which contain large amounts of glycerin or pepsin, filter more slowly and require from twenty to eighty pounds pressure per square inch. Successful manipulation of this class of liquids depends upon judicious use of filtering agent and adjustment of the safety tube. The liquid will automatically regulate the pressure in most cases and the operator can judge the condition of filtration by the flow of filtrate. It is a mistake to attempt to force the filtration by increasing the pressure as this procedure nearly always results in clogging. It is better to adjust the volume delivered to that which issues from the press by shortening the stroke of the pump and, in this connection, it is well to make notes of the conditions and difficulties observed during the filtration of a preparation for such notes will save time and trouble on future batches.

The class of liquids which requires the most art in handling is that which comprises the very thick, heavy, viscous, or mucilaginous solutions and fluids complicated by a large amount of precipitation, particularly of starch or dextrin. Trouble may always be expected from preparations of rhubarb, buchu, uva ursi, senna, and gentian if, as is frequently the case, the drugs have been percolated with menstrua of low alcoholic content. That difficulty can be avoided by proper pharmacy yet it does occasionally present itself. However, all such liquids may be successfully filtered in the press if due attention be paid to the conditions. It may be necessary to age the fluid first and this is desirable where there is precipitation of starchy matters. Mucilage is the most difficult complication to deal with. The best and proper way to eliminate it is to leave it in the drug in the percolator, for when it gets into the finished liquid all there is left to do is to summon all available patience, use plenty of kieselguhr, and throttle the pump down to ten gallons per hour. In filtering liquids of this class it may become necessary to stop the operation for the purpose of cleaning the chambers, washing the cloths and adjusting fresh papers on them. This removes a mass of precipitate and gives the liquid a new opportunity to pass through. It is worthy of note that it is practically impossible to filter such preparations clearly by gravity.

Occasionally it will be found advantageous to line the chambers with a layer of filtering agent before attempting to filter the preparation in hand. This procedure prevents the precipitate from enter-



ing the interstices of the paper and clogging it. To line the chambers it is necessary only to mix a small amount of filtering agent with five gallons of water and pump the mixture through the press continuing until all the water is drained out. In general, the first liquid which flows from the press will be cloudy and a clear filtrate will not be obtained until a small layer has formed on the papers.

The fourth category of liquids is represented by strongly alcoholic or ethereal fluids. With these the press has a decided advantage over all other methods for filtration, for by employing the channel into which the chambers drain it is possible to filter such mixtures with a minimum of loss of solvent.

The selection of the filtering agent may decide the success or failure of the process. Some such agent is necessary in all pharmaceutical uses of the press to assist in the solution of oils, to dilute gummy or resinous precipitates and prevent them from clogging through deposition in the interstices of the papers, and to form nuclei on which microscopic particles of precipitate may agglomerate and form grains of filterable size. Kieselguhr, talcum, kaolin, magnesium carbonate, and calcium phosphate may be used and their practicability appears to be in the stated order. Kieselguhr is universally applicable; it is light in texture, fine in size and does not pack firmly on the papers. It is chemically quite inert. Sometimes an admixture with talcum may be used and, for heavy work, this is judicious. Talcum itself is second only to kieselguhr, but is likely to pack firmly on the papers, which unfits it for use with viscous liquids.

Kaolin cannot be used in the presence of mucilage, starch, digestive ferments, or ox gall, with which it forms a slimy mass that clogs persistently and so decreases the rate of filtration. For simple elixir and similar preparations it will serve, but presents no advantages over kieselguhr. Magnesium carbonate and calcium phosphate are excluded from nearly all mixtures by their chemical activity. It is probable that much of the precipitation which has occurred in bottled preparations may be traced to the use of either one of these salts in filtration. Neither of them has any advantages not possessed by kieselguhr. They should never be used in acid liquids and the magnesium compound will precipitate acid coloring matters, i. e., carmine, from solution.

The best results cannot be obtained even if all the above mentioned points are scrupulously observed unless the apparatus itself is

well cared for. It should be thoroughly cleansed after each filtration by removing the distance frames with their accumulation of precipitate and pumping water through the press. The cloths should be washed in hot water with the addition of appropriate chemicals if necessary. The papers will serve for but one filtration and should be thrown away at its conclusion. When heavy precipitates have been filtered out the pump should be taken apart and cleaned, the connecting pipes, safety tube and air chamber should receive the same treatment. This must be done shortly after the filtration for pharmaceuticals soon dry onto iron and the masses adhere so tenaciously as to make the cleaning a matter of considerable labor.

In all cases it must be remembered that the filter press is a delicate piece of apparatus and demands careful attention to produce the best results. We believe that it has a place in pharmaceutical manufacturing which cannot be taken by any other filtering process in use at the present time. It may be difficult to adjust it to suit some certain condition sometimes, but it always amply repays the labor spent upon it. It is substantial and less liable to serious injury than most pharmaceutical apparatus. The products filtered through it are as elegant in appearance and as stable as the best. Its use indicates a distinct advance in pharmaceutical manipulation.

(Contribution from the Pharmaceutical Laboratory of the Standard Chemical Co., Des Moines, Iowa.)

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## THE TEXTBOOK AND THE COLLEGE.

DEAN LUCIUS E. SAYRE, UNIVERSITY OF KANSAS SCHOOL OF PHARMACY.

Dean Lucius E. Sayre, of the college of pharmacy of the University of Kansas, visited the University of Minnesota during the week of October 23. On Thursday morning he was introduced to the students of the college of pharmacy by Dean Wulling and delivered a most interesting address. In introducing Professor Sayre, Dean Wulling stated that the college of pharmacy of the University of Minnesota had contemplated for many years the securing of prominent pharmacists in both this country and abroad for special lectures and that while not as many such speakers had been obtained as the college had hoped for, yet some of exceptional note had already lectured, and that others would probably be secured in

the near future. Dean Wulling referred to Professor Sayre as one of the leaders in American pharmacy, stating that he was one of the foremost pharmaceutical educators in this country.



Professor Lucius E. Sayre, Dean of University of Kansas School of Pharmacy.

Dean Sayre prefaced his remarks by congratulating Minnesota pharmacists on having a central institution such as the University of Minnesota College of Pharmacy. He congratulated Dean Wulling, not only on his pharmaceutical activities in Minnesota, but also as past president of the American Conference of Pharmaceutical Faculties and as the present president of the American Pharmaceutical Association.

Dean Sayre stated that he had selected as the topic for his lecture "The Textbook and the College." He asserted that there

are too many textbook pharmacists and too few college pharmacists. He felt that there was great need for more personal contact between the pharmaceutical instructor and the pharmaceutical student, that there should be a direct study of many of the problems concerning pharmacy and that individual textbook review could not possibly give the kind of training which pharmacy demands today. The college of pharmacy, he felt, should represent a collection and a coöperation of students, including the instructors and professors, all of whom should work together as scholars for the solution of the problems of the profession.

In commenting on the duties of the student, Dean Sayre called attention to the fact that their studies should not end with graduation but rather that they should continue as long as the individual carried on pharmaceutical work. The pharmacy students of today will take positions in the future along commercial and professional lines, he said. They will handle the pharmaceutical legislation in the days to come.

Dean Sayre referred at some length to the extensive discussions of the present time concerning higher educational requirements for pharmacists. He stated that college work was essential and referred to Professor Newcomb's reports on the conventions of the A. C. Ph. F., N. A. B. P., and the A. Ph. A., which, he stated, truly indicate that all pharmacists are gradually coming to recognize that the requirement of college work would be advantageous to pharmacy.

The question as to whether or not drug clerks are scarce was discussed. Dean Sayre asked whether or not the scarcity of clerks was due to our present educational requirements, and in answering he stated: "I am inclined to believe that it is not high requirements, perhaps, so much as, maybe, it is low requirements that are promulgated and fostered by certain individuals and institutions. The 'short course' and makeshifts for an education tend to lower the vocation so that young men of ability, who might be attracted to it, are rather repelled.

"Recently it happened that a drug clerk, who has had considerable experience as a clerk in Kansas, came into my office. I asked him to express his views as to the cause of the scarcity of drug clerks. He remarked that it was his experience that young men were being discouraged from entering the pharmaceutical profession because of the fact that standards were so low that the business was not attractive to them. The output from the short-course

schools was filling the vacancies, discouraging good education and training.

"This young man had come from 'filling in' a position in one of the stores in a lively town of the state. On leaving, the proprietor told him that he had never had a clerk with whom he was satisfied until he had hired a college man. A few days before this young man left the store referred to, the proprietor told him he was very glad to have had him because it had taught him how valuable a trained college pharmacist was to a store.

"This testimony, it should be said, was not prompted by any views expressed by myself."

Furthermore Dean Sayre said that college education is necessary in order that our after lives may be satisfactory to ourselves. He urged college men to continue their pharmaceutical activities through alumni association work. He stated that in Kansas there were 1,000 pharmacists who had never taken college work and that these men had soon come to be at a disadvantage with the college men, and that college men are usually well rounded and broad commercially and scientifically. The results of an investigation concerning the location and occupations of 1,000 graduates of the University of Kansas were discussed and he stated that the college men carry on a great diversity of work and that they were uniformly successful.

Dean Sayre discussed the college curriculum in relation to the students, stating that the college should be broad and that it should attempt to educate and train young men and women for whatever locations they, as pharmacists, may find themselves in the future. He strongly urged students with special likings to take advanced work along these lines. Students who follow specific lines are more likely to meet with exceptional success, he declared.

Close acquaintanceship among students was recommended and the value of such comradeship was emphasized by reminiscent remarks concerning the time when the speaker was a student at the Philadelphia College of Pharmacy, where lasting friendships were formed with such men as Maisch, Procter and Parrish. Following this thought further the value of association with men of national reputation was emphasized.

Dean Sayre expressed the hope that what he had said would not be taken in any way as an attack upon short-course schools but rather it was his belief that such courses should be lengthened to a



minimum in proportion with the needs of the profession of pharmacy. Dean Sayre said:

"Success in pharmacy has become synonymous with success in business. But what of the scientific qualifications of the pharmacist. While it is largely true today that the so-called successful pharmacist must be, first of all, a business man, indications all point to the fact that scientific equipment will be the future ruling criterion. The future pharmacist must thus have, more than ever, an attitude which bespeaks scientific, professional confidence as well as business ability. It is for this reason, in part, although, of course, not primarily, that we are ever insisting on increased requirements and longer curricula in our pharmacy schools. Commercialism has taken all too deep root in our profession and nothing but a healthy scientific spirit can adequately counteract it. Young men leaving schools of pharmacy should be alive to this fact and be sympathetic toward the advances of the morrow. It may be that the future will insist on a quality of intellect that we shall have to change from the quality of affability and business acumen to an air of intellectual competency. Those who are closely in touch with the medical profession today know this demand of the future is imperative for greater professionalism.

"One of our writers on commercial pharmacy insists that pharmaceutical education needs rebuilding, that it should tend to a larger instruction in business methods and that the strictly professional lines should be subservient, that the object of the preparation for the boards of pharmacy examinations shall be changed to an accomplishment of better business training. What folly could be worse! While we have not ignored the value of business training, any observer of our pharmaceutical life can readily see that we are now steeped in a commercialism which threatens the very existence of our profession. The nation, the state and the public in general regard us as a profession. If this halo were to be removed from our corner drug store and we should be obliged to enter into competition with the grocer, butcher, etc., pharmacy would cease to exist."

The speakers discussed the general question of patent medicines and emphasized the importance of pharmacists taking an active part in eliminating fakes and nostrums. He also commented upon the large percentage of drugs and medicines which are not sold by the registered pharmacist and stated that upwards of 35 per cent. went direct to the customers from the hands of the physician. In closing

the speaker stated that the future welfare of pharmacy, in his opinion, would depend on whether it should be more prominent commercially or whether the professional side should be emphasized.

### CARREL-DAKIN SOLUTION.<sup>1</sup>

*To the Editor:*—I have just read in THE JOURNAL, Oct. 7, 1916, p. 1108, a short note about the formula for Dakin's solution. I believe that the answer will not allow your reader to obtain the proper kind of solution. Therefore, I take pleasure in sending you the description of the technic which is used in my hospital for the making of the solution.

A. CARREL, M.D.,  
Hôpital Temporaire 21, Rond-Royal, Compiègne, France.

#### PREPARATION OF DAKIN'S SOLUTION (DAUFRESNE'S TECHNIC).

Dakin's solution is a solution of sodium hypochlorite for surgical use, the characteristics of which, established after numerous tests and a long practical experience, are as follows:

(a) *Complete Absence of Caustic Alkali.*—The absolute necessity for employing in the treatment of wounds a solution free from alkali hydroxid excludes the commercial Javel water, Labarraque's solution and all the solutions prepared by any other procedure than the following:

(b) *Concentration.*—The concentration of sodium hypochlorite must be exactly between 0.45 and 0.50 per cent. Below 0.45 per cent. of hypochlorite the solution is not sufficiently active; above 0.50 per cent. it becomes irritating.

*Chemicals Required for the Preparation.*—Three chemical substances are indispensable to Dakin's solution: chlorinated lime, anhydrous sodium carbonate and sodium bicarbonate. Among these three products the latter two are of a practically adequate constancy, but this is not the case with the first. Its content in active chlorin (decoloring chlorin) varies within wide limits, and it is absolutely indispensable to titrate it before using it.

*Titration of the Chlorinated Lime.*—There must be on hand for this special purpose:

<sup>1</sup> Reprinted from *Jour. Amer. Med. Assoc.*, December 9, 1916, p. 1777.

A 25 Cc. buret graduated in 0.1 Cc.

A pipet gaged for 10 Cc.

A decinormal solution of sodium thiosulphate (hyposulphite).

This decinormal solution of sodium thiosulphate can be obtained in the market; it can also be prepared by dissolving 25 Gm. of pure crystalline sodium thiosulphate in 1 liter of distilled water, and verifying by the decoloration of an equal volume of the decinormal solution of iodine by this solution. The iodine is prepared by dissolving 1.27 Gm. iodine and 5 Gm. potassium iodide in 100 Cc. of water.

The material for the dosage thus provided, a sample of the provision of chlorinated lime on hand is taken up either with a special sound or in small quantities from the mass which then are carefully mixed.

Weigh out 20 gm. of this average sample, mix it as completely as possible with 1 liter of ordinary water, and leave it in contact for a few hours, agitating it from time to time. Filter.

Measure exactly with the gaged pipet 10 Cc. of the clear fluid; add to it 20 Cc. of a 1:10 solution of potassium iodide and 2 Cc. of acetic or hydrochloric acid. Drop, a drop at a time, into this mixture a decinormal solution of sodium thiosulphate until decoloration is complete.

QUANTITIES OF INGREDIENTS FOR TEN LITERS OF DAKIN'S SOLUTION.

Titer of Chlorinated Lime.	Chlorinated Lime, Gm.	Anhydrous Sodium Carbonate, Gm.	Sodium Bicarbonate, Gm.
20	230	115	96
21	220	110	92
22	210	105	88
23	200	100	84
24	192	96	80
25	184	92	76
26	177	89	72
27	170	85	70
28	164	82	68
29	159	80	66
30	154	77	64
31	148	74	62
32	144	72	60
33	140	70	59
34	135	68	57
35	132	66	55
36	128	64	53
37	124	62	52

The number of cubic centimeters of the hypochlorite solution required for complete decoloration, multiplied by 1.775, gives the weight of the active chlorin contained in 100 Gm. of the chlorinated lime.

This figure being known, it is applied to the accompanying table, which will give the quantities of chlorinated lime, of sodium carbonate and of sodium bicarbonate which are to be employed to prepare 10 liters of Dakin's solution.

Example: If it required 16.6 Cc. of the decinormal solution of the sodium thiosulphate for complete decoloration, the titer of the chlorinated lime in active chlorin is:

$$16.6 \times 1.775 = 29.7 \text{ per cent.}$$

The quantities to be employed to prepare 10 liters of the solution will be in this case:

Chlorinated lime .....	154 gm.
Dry sodium carbonate .....	77 gm.
Sodium bicarbonate .....	62 gm.

If crystalline sodium carbonate is being used, then instead of the 80 Gm. of dry carbonate it must be replaced by:

Crystalline sodium carbonate..... 220 gm.

*Preparation of Dakin's Solution.*—To prepare 10 liters of the solution:

1. Weigh exactly the quantities of chlorinated lime, sodium carbonate and sodium bicarbonate which have been determined in the course of the preceding trial.
2. Place in a 12-liter jar the chlorinated lime and 5 liters of ordinary water, agitate vigorously for a few minutes, and leave in contact for from six to twelve hours, over night, for instance.
3. At the same time dissolve, cold, in the five other liters of water the sodium carbonate and the bicarbonate.
4. Pour all at once the solution of the sodium salts into the jar containing the maceration of chlorinated lime, agitate vigorously for a few moments, and leave it quiet to permit the calcium carbonate to settle as it forms. At the end of half an hour, siphon the liquid, and filter it through double paper to obtain an entirely limpid product, which must be protected from light.

Light, in fact, alters quite rapidly solutions of hypochlorite, and it is indispensable to protect from its action the solutions which are to be preserved. The best way to realize these conditions is to keep the finished fluid in large wicker-covered demijohns of black glass.

*Titration of Dakin's Solution.*—It is a wise precaution to verify, from time to time, the titer of the solution. This titration utilizes the same material and the same chemical substances as are used to determine the active chlorin in the chlorinated lime:

Measure out 10 Cc. of the solution, add 20 Cc. of 1:10 solution of potassium iodid, and 2 Cc. of acetic or hydrochloric acid. Drop, a drop at a time, into this mixture a decinormal solution of sodium thiosulphate until decoloration is complete.

The number of cubic centimeters employed multiplied by 0.03725 will give the weight of the sodium hypochlorite contained in 100 Cc. of the solution.

A solution is correct when, under the conditions given above, from 12 to 13 Cc. of decinormal thiosulphate are required to complete the decoloration:

$$13 \times 0.03725 = 0.485 \text{ per cent. of NaOCl.}$$

*The Test for the Alkalinity of Dakin's Solution.*—It is easy to differentiate the solution obtained by this procedure from the commercial hypochlorites and from Labarraque's solution:

Pour into a glass about 20 Cc. of the fluid, and drop on the surface a few centigrams of phenolphthalein in powdered form. Dakin's solution, correctly prepared, gives absolutely no change in tint, while in the same conditions Javel water and Labarraque's fluid give an intense red coloration which indicates in the latter two solutions the presence of free caustic sodium.

*Apparatus Required for Sterilization of Wounds.*—1. One liter bottles, the lower opening with an interior diameter of 7 mm.

2. Distributing tubes with one, two, three or four branches (Gentile).

3. Connecting tubes: (a) cylindric tubes, 2.5 cm. long, interior diameter, 4 Mm.; (b) cylindric tubes, 4 Cm. long, interior diameter, 7 Mm.; (c) Y tubes, interior diameter, 7 Mm.

4. Mohr pinch-cocks.

5. Irrigating tubes. Drain tubes No. 30 (interior diameter, 7 Mm.).



6. Connecting tubes. Drain tubes No. 16 (interior diameter, 4 Mm.), closed at one end. Above this end these tubes are perforated with holes from 0.5 to 1 Mm. in diameter:

(a) Tubes perforated for 5 Cm., 30 Cm. long; (b) Tubes perforated for 10 Cm., 30 Cm. long; (c) Tubes perforated for 15 Cm., 40 Cm. long; (d) Tubes perforated for 20 Cm., 40 Cm. long.

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### BOOK REVIEWS.

MANUAL OF CHEMISTRY, by W. Simon, Ph.D., M.D., Late Professor of Chemistry in the College of Physicians and Surgeons, and in the Baltimore College of Dental Surgery; and Daniel Base, Ph.D., Professor of Chemistry in the Maryland College of Pharmacy. Eleventh Edition. Cloth, 648 pages; price \$3.50. Lea & Febiger, Philadelphia, Publishers.

This textbook has reached its eleventh edition, which is conclusive evidence of its merits. The revision was probably made necessary by the advent of a new pharmacopœia, but the author (Dr. Base) has taken advantage of the occasion to recast a number of sections, to introduce new matter, and to delete some which is no longer deemed necessary in a book on chemistry, intended for medical and for pharmaceutical students. The book is primarily a textbook—a teaching book—and only secondarily a reference book. This accounts for the arrangement, and for the divisions, Chemical Physics, General Chemistry, Metals and their Combination, and Analytical, and Organic Chemistry. The division dealing with the metals and their compounds, is particularly valuable, and includes besides the descriptive chemistry, a very serviceable compilation of tests. That phase of chemistry which may be spoken of as the philosophical, is dealt with under the heading General Chemistry, and in connection with the non-metallic elements.

The colored plates, on which are reproduced the colors of the more important precipitates in qualitative analysis—plates which have been a conspicuous feature of this textbook, have been retained in this revision.

The paper, type, and binding are excellent. All in all, the eleventh edition of the "Manual of Chemistry" is a worthy successor to the editions which have preceded it, and which have found

their way to the book shelves of many medical and pharmaceutical students.

J. W. STURMER.

HISTOLOGY OF MEDICINAL PLANTS, by William Mansfield, A.M., Phar.D., Professor of Histology and Pharmacognosy, College of Pharmacy of the City of New York, Columbia University. John Wiley & Sons, Inc., New York, 1916.

Vegetable histology is an exceedingly important branch of pharmacognosy. Dr. Mansfield's book, evidently intended as an introductory course to the study of pharmacognosy, should be welcomed to the field because it shows an increasing interest in that subject rather than for any new data presented.

The book is divided into three parts: Part I, consisting of 49 pages, is a brief discussion of the microscope and microscopic technique. The illustrations contained in this portion of the book may be found in the catalogues of the various houses dealing in microscopes. The discussion of microscopic technique is very incomplete and should have been supplemented by references to some of the standard works on this subject.

Part II includes the fundamental consideration of tissues, cells and cell contents, classified from a physiological point of view. This portion of the book is profusely illustrated with line drawings, many of them on a very generous scale, and, with a few exceptions, well done. While the drawings are original, the subjects have been handled by a number of previous investigators. In some cases the drawings are incomplete, which will cause confusion to the student. Plate 30, illustrating collenchyma, and plates 39 and 46, showing root hairs and sieve tubes respectively, are incomplete and misleading, while plate 51 conveys an entirely false impression, owing to the dividing lines between the cells being omitted, a fault even more pronounced in plate 68. Starch grains are shown with a granular or dotted surface, which, while it adds to the attractiveness of the drawings, should be discouraged. The author classifies bast fibers into a number of more or less well defined groups, which would be useful, if nature did not insist upon merging one into another by every conceivable variation. Emphasis is placed upon the study of calcium oxalate crystals, which is noteworthy in that it tends to confirm the studies of Dr. Kraemer, published in a paper and read at the St. Louis meeting of the American Pharmaceutical Association in 1901.

In Part III the histology of the following drugs is given: *Spigelia*, *Ruellia*, *Marrubium vulgare*, *Marrubium peregrinum*, *Buchu*, *Pinus alba*, *Quassia*, *Pyrethri*, *Flores*, *Petroselinum*, *Amygdala Dulcis*. Sections of mountain laurel and trailing arbutus are also given, together with a study of pollen grains and the papillæ of the stigmas of a number of flowers. Of course every author has his own ideas as to proper selection of material for study and will be largely influenced by his own practical experience. An incomplete index handicaps the book for use as a work of reference.

This book will be found valuable in courses of histology where there are well-trained teachers to handle the subject and interpret the author's drawings and statements. It will also be found useful as a work of reference for the special drugs which are considered in detail.

JOHN MOSER, JR.

THE NATIONAL STANDARD DISPENSATORY.—Containing the Natural History, Chemistry, Pharmacy, Actions and Uses of Medicines, including those recognized in the Pharmacopœias of the United States, Great Britain and Germany, with numerous references to other Foreign Pharmacopœias. In accordance with the Ninth Decennial Revision of the U. S. Pharmacopœia. By Hobart Amory Hare, B.Sc., M.D., Professor of Therapeutics, Materia Medica, and Diagnosis in Jefferson Medical College, Philadelphia; Charles Caspari, Jr., Ph.G., Phar.D., Professor of Theoretical and Applied Pharmacy in the University of Maryland, Baltimore; and Henry H. Rusby, M.D., Professor of Botany and Materia Medica in the College of Pharmacy of the City of New York. New (3d) edition, thoroughly revised. Magnificent imperial octavo, 2103 pages, with 465 engravings. Cloth, \$9.50; full leather, \$11.50; thumb-letter index, 50 cents extra. Lea & Febiger, Publishers, Philadelphia and New York, 1916.

With the advent of the new U. S. Pharmacopœia, we are accustomed to the announcements of new editions of the several dispensaries. The first of the latter in the field apparently is the National Standard Dispensatory. When one reaches middle life and has been accustomed to consult this class of works, he is not likely to become very enthusiastic over the new editions. The publishers may say that they have "been revised in every line to cover the latest advances in the whole vast field of Materia Medica, Phar-

macy and Therapeutics," yet anyone who is conversant with the previous editions and the advances of science soon finds on comparison that this is far from the case. In the present work it is stated that the United States Pharmacopœia is "here embodied as a whole," but even this is far from the truth. This opens up an entirely new question in regard to the use of the text of the United States Pharmacopœia and as to whether when permission is granted to publishers to use this text, it should not be insisted that it be used in its entirety. This is hardly the place in a review of a work like this to discuss such questions even though they are prompted by the opportunity for review.

The authors' preface probably gives the best idea of the prominent features of the work which they have written. In the present volume it is stated that "the complete Pure Food and Drugs Act and Regulations, as well as the Harrison Narcotic Law, have been appended, together with the official decisions necessary to their interpretation. This is a very valuable addition, as it contains many of the F. I. D. decisions relating to the regulations concerning the labelling and marketing of medicinal and other products. The pharmacist should have this information at his command, and while the decisions can be obtained from the government for the mere asking, it is very likely that the separate decisions are likely to be mislaid when required for use. Outside of very slight changes, the preface of the present edition is almost the preface of the earlier editions verbatim. It is true that there are some changes in the text and it may be that any number of causes have prevented a more complete revision being made. The statement is made in the preface that "at least 200 new articles have been introduced." Most of these probably relate to the drugs in the National Formulary, but even these are far from being complete.

In conclusion, the reviewer should say this, that the information which is given, even though incomplete, may be relied upon as being more or less accurate. The editors and collaborators are all men of eminence and prominence in their respective professions.

H. K.



## PHILADELPHIA COLLEGE OF PHARMACY.

## MINUTES OF THE QUARTERLY MEETING.

The quarterly meeting of the Philadelphia College of Pharmacy was held December 26, 1916, at 4.15 P.M. in the Library, the president, Howard B. French, presiding. Fourteen members were present. The minutes of the semi-annual meeting, held September 25, were read and approved. The minutes of the board of trustees for September, October, and November were read by the registrar, J. S. Beetem, and approved. Professor Kraemer in commenting on the minutes of the board of trustees said the board was to be commended for the large amount of important business transacted during the past three months. The president expressed his appreciation for the remarks of Professor Kraemer.

The secretary read the report of the joint committee of the board of trustees and the Alumni Association on the celebration of the Fiftieth Anniversary of the Alumni Association. The report was prepared by Professor E. F. Cook, chairman of the committee on exhibition, and gave a detailed description of the various exhibits and the names of many of the exhibitors. A report on the exhibition prepared by Dr. R. P. Fischelis was published in the *AMERICAN JOURNAL OF PHARMACY*, December, 1916, pages 529-541.

The president announced the death of Martin I. Wilbert on November 25, who was a member of the college since 1893. On motion it was voted that a committee of three be appointed to draft suitable resolutions to his memory. The president appointed H. K. Mulford, Joseph P. Remington and Dr. F. E. Stewart.

The resignation of William A. Carpenter, an active member, because of impaired health, was presented and accepted.

Dr. A. W. Miller for the committee on the relief of Belgian Pharmacists asked for instructions as to the disposition of the funds in the hands of the treasurer. After some discussion it was voted that the funds on hand be transmitted to the Netherlands Pharmaceutical Society to be distributed as needed.

Professor Remington announced that our fellow member L. L. Walton had been reappointed to the Pennsylvania Board of Pharmacy, and thought a record of the appointment should be made in the minutes of the college.

Dr. F. E. Stewart proposed that an invitation be extended to the



graduates of the Philadelphia College of Pharmacy and of the department of pharmacy of the Medico-Chirurgical College to unite with the college and participate in its transactions, when, on motion, it was voted that the matter be referred to the committee on membership.

Mr. George M. Beringer donated to the college an opium pipe. The thanks of the college were tendered the donor.

Professor Kraemer on behalf of Mr. George L. Carnan of the class of 1885 presented a very old lignum vitæ mortar. The thanks of the college was tendered the donor.

Professor Kraemer on behalf of Mr. Henry C. Blair presented a large reproduction of the historic drug store at 800 Walnut street. The painting was made in 1835 before the days of photography. In a descriptive letter accompanying the picture it is stated the building was erected in 1812 and with the exception of a change in the bulk windows the building is practically the same now as it was when first built. The outside sign of "Pharmaceutist" is believed to be the first of its kind in this country. There were also presented on behalf of Mr. Blair the matriculation tickets of three generations of Blairs. These interesting historic relics were accepted and the thanks of the college tendered our fellow member, Mr. H. C. Blair.

The president made the following appointments:

*Committee on Legislation:* Theodore Campbell, chairman; Joseph P. Remington, W. L. Cliffe, Samuel C. Henry, Warren H. Poley and R. H. Lackey.

*Committee on Membership:* Joseph W. England, chairman; R. H. Lackey, O. W. Osterlund, with the treasurer and secretary ex-officio.

C. A. WEIDEMANN, M.D.,  
*Recording Secretary.*

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

September 5, 1916. No quorum present, as many members of the board were attending the meeting of the American Pharmaceutical Association, held at Atlantic City.

September 12, 1916. Twelve members were present. Regrets were received from Messrs. Lemberger, Mulford and Shoemaker.

The Committee on Property reported that the college buildings were in good condition; and although it was necessary to make some

repairs and alterations, everything would be ready for the opening day.

The Committee on Finance made a report upon salaries and the mode of payment, which was approved.

The Committee on Scholarships reported that some of the students to whom scholarships had been awarded desired to continue their studies for higher degrees, particularly the B.Sc. degree. After further explanation and discussion, it was voted that "such students may matriculate for other courses leading to degrees, upon the payment of the difference in the fees of the two courses."

On motion it was voted that Louis J. Gershenfeld, P.D., class of 1915, be awarded the Clayton French Fellowship, providing he was able to take up the work as assistant to Professor Roddy.

The Committee on Examinations reported that Paul D. Sands, P.D., had successfully passed all his examination in analytical chemistry and was, therefore, recommended to receive the certificate of proficiency in chemistry. On motion the certificate was awarded.

The Committee on Announcement reported the issue of 1916-17 catalogues and the Bulletins, the latter with an insert relative to the merger with the department of pharmacy of the Medico-Chirurgical College.

The Committee on Commencement reported that the Academy of Music had been leased for Wednesday evening, June 6, 1917, for the commencement exercises of the college.

The amendment to the by-laws presented at a previous meeting was again read and adopted.

A communication was received from George F. Troutman, class of 1892, requesting a duplicate diploma, the original having been destroyed by fire. All the requirements had been complied with and therefore, on motion, the secretary was instructed to have a duplicate diploma prepared.

The Committee on By-Laws offered additional amendments to the by-laws, which were held over for future action.

Committee on Membership reported favorably on the application of Lewis M. Hires for active membership in the college. A ballot was taken and he was unanimously elected.

October 3, 1916. Thirteen members were present. A communication was received from the secretary of the college reporting that Messrs. Edwin M. Boring, Charles Leedom and Theodore Campbell had been reelected to membership in the board of trustees for the ensuing three years.

The Committee on Property recommended that additional insurance to the amount of \$25,000 be placed on the college and also that a new inventory of contents should be made. This recommendation was approved. The Committee on Property further reported that the office for the associate dean and also the lunch room for the convenience of the women students had been completed.

The Committee on Scholarships was given power to act in the award of scholarships. On motion of Mr. French, the Thomas S. Wiegand Scholarship was awarded to Sister Mary Beatrice.

The Committee on Announcement presented the report of Mr. J. R. Graham, the publicity agent, and also his resignation, he having accepted a position in another state. The report was received and the resignation was accepted with regret.

The Committee on Membership reported favorably on the application of Ivor Griffith and Charles L. Liebert, for active membership in the college. A ballot was taken and they were unanimously elected.

November 8, 1916. Thirteen members were present. The amendments to the by-laws proposed at a previous meeting were adopted.

The Committee on Property recommended that 25 steel lockers be added to the accommodations and that some alterations be made in the registrar's office. The committee was given power to act.

The Committee on Library reported that up to date 9,062 books had been accessioned and shelf-listed and 4,569 books catalogued. A number of purchases had been made and some gifts were received. 314 persons used the library during the month.

The Committee on Instruction made a number of recommendations which were considered seriatim.

First. The large class of students enrolled necessitates three additional student assistants in the laboratories. Approved.

Second. To departmentize the faculty into four subdivisions, namely:

The Department of Pharmacy under the direct supervision of Professor Remington, to include Professors Remington, LaWall, Cook, Vanderkleed and instructors, Professor Truesdell, Dr. F. E. Stewart and Mr. Ivor Griffith.

The Department of Chemistry, under the chairmanship of Professor Moerk, to include Professor Moerk, Emeritus Professor Samuel P. Sadtler, Professors Stroup and Sturmer.

The Department of Botany, Pharmacognosy and Materia Medica, under the chairmanship of Professor Kraemer, to include Professor Kraemer, Dr. C. B. Lowe and Dr. P. S. Pittenger.

The Department of Bacteriology, under Dr. J. A. Roddy.

It is intended that the members of these various departments of the college faculty hold frequent conferences to harmonize the instruction in the departments, to outline advances in the courses and to economize the time. Approved.

The Committee on Instruction also recommended postponing the date for advancing the entrance requirements to the completion of two years' high school work, from the beginning of the session of 1917 to the beginning of the session 1918. Approved.

Professor Remington reported the selection of Mr. A. H. Fitzkee, class of 1916, as instructor in operative pharmacy. This was approved.

The Committee on Examinations reported that Harry Lounsbury, P.D., class of 1916, had satisfactorily completed the special course in bacteriology and was entitled to receive the certificate. On motion the certificate was awarded.

The application of Clayton S. Hill, class of 1916, for a duplicate diploma was read (the original diploma having been damaged). As all the requirements had been complied with, the request was granted.

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## CURRENT LITERATURE.

### SYRUP OF TEA.

Charles H. and M. R. LaWall (*Proc. Penn. Pharm. Assoc.*, 1916) proceed as follows in making a plain Tea syrup which seems to be permanent and satisfactory: Place 1 lb. of Tea siftings in a glass percolator after moistening slightly with cold water; pack firmly, and pour boiling water over the tea until 64 fl. oz. of percolate have been obtained. Place  $7\frac{1}{4}$  lbs. of dry granulated sugar in 1 gallon bottle, add sufficient of the tea infusion to fill the container and dissolve the sugar by agitation, subsequently sterilizing the finished preparation in the customary manner. As it is a little difficult to dissolve the sugar by agitation, the sugar may be dissolved during the sterilization.